

In the Office Action the Examiner indicated that claims 1-6, 9-12, 21 and 22 were allowed. The Examiner's indication of the allowance of these claims has been gratefully acknowledged.

Claims 7, 8, 13-20 are rejected under 35 U.S.C. 102(b) as being anticipated by the patent to Nolting, et al.

Also, claims 7, 8, 13-20 are rejected under 35 U.S.C. 103 over the patent to Corniau.

Finally, claims 7, 8, 13-20 are rejected under 35 U.S.C. 103(a) over the patent to Nolting, et al in view of the patent to Banzhaf, et al.

After carefully considering the Examiner's grounds for the rejection of the claims over the art, it is respectfully submitted that in the applicant's opinion the present invention as defined in the claims rejected in the last Office Action by the Examiner should be considered as patentably distinguishing over the art.

Turning now to the references and in particular to the patent to Nolting, et al, it can be seen that this reference deals with a device and a method for engine cooling.

In the patent to Nolting, in contrast to the method defined now in the claims, an electrical pump 23, as well as a mechanical pump 22 driven by a combustion engine are disclosed. The mechanical pump 22 is always active when the internal combustion engine is in operation.

In contrast to the method defined in the current claims of the present application, in the patent to Nolting the cooling medium flow is not operated by an electrical pump, but instead by a mechanical pump, which under special conditions is supported by an electrical pump. Even for this particular feature, the method defined in the claims should be considered as new over the solution proposed in the patent to Nolting.

Furthermore, the patent to Nolting does not disclose any teaching how to prevent a cooling medium feeding by a thermal syphon action. This reference does not provide any hint or suggestion and any disclosure for the thermal syphon action.

Claim 7 specifically defines the following:

"...and preventing a cooling medium feeding by a thermal syphon action, by closing the valves in a first operational phase of the internal combustion engine at low temperature of the internal combustion engine".

This is neither disclosed in the patent to Nolting nor can be considered as obvious from this reference.

When the method is performed in accordance with the present invention, then with the active internal combustion engine the pump which drives the cooling medium can be shut off, and moreover the remaining minimum feeding of the cooling medium (with the turned-off pump) by the thermal syphon action can be suppressed by closing the valves as defined in the claims.

Such a method is not possible with the device and method disclosed in the patent to Nolting. When the internal combustion engine disclosed in the patent to Nolting is active, then the mechanical cooling medium pump 20 is also active. Therefore in the patent to Nolting a remaining feeding of the cooling medium because of the thermal syphon action does not occur, since the mechanical cooling medium pump can not be turned off separately from the internal combustion engine.

Therefore it is believed to be clear that the solution proposed in the patent to Nolting can not carry out the method in accordance with the present invention as defined in the claim 7.

As for the Examiner's rejection of claim 8, it is believed that the arguments presented with respect to claim 7 are partially applicable for this claim as well.

Claim 8 specifically defines that the cooling medium flow is driven by an electric cooling medium pump. This is not the case in the patent to Nolting. The cooling medium flow in the patent to Nolting is in principle driven by a mechanical pump 22, and only in the case when an increased cooling medium feeding is required, an electrically controlled cooling medium pump is additionally connected. The cooling medium of the device disclosed in the patent to Nolting is therefore driven either by a mechanical cooling medium pump or by a mechanical cooling medium pump with an electrically driven cooling medium pump. The cooling medium flow in the patent to Nolting is thereby not driven by an electrically driven cooling medium pump.

Therefore the new features of the present invention as defined in claim 8 should be considered as new over the solution proposed in the patent to Nolting.

On page 7 of the Office Action the Examiner agreed that the patent to Nolting does not disclose forming the cooling medium flows by an electrically driven pump.

Claim 8 additionally defines that at cold outside temperatures in a first operational phase of the internal combustion engine at low temperatures the cooling medium feeding is reduced by closing the valve 34 and opening the valve 36 to a heating circuit. When the valve 34 is closed as defined in the claim, then neither a cooling medium feeding through the first cooling medium branch 28 (bypass) nor through the second cooling medium circuit 30 by the main cooler 60 is not provided. The cooling medium in this case is fed only through the third cooling medium branch 32 with the heating heat exchanger 20.

In the device disclosed in the patent to Nolting, the first valve is however not closed, but the valve 18 is connected so that the cooling medium flow can flow no longer through the main radiator 16, but instead only through the bypass passage 17. In column 5, starting from line 6 in the patent to Nolting it is specifically stated:

"If the cooling capacity provided by the second heat exchanger 20 is sufficient for engine cooling, the valve 18 can completely block the coolant flow through the first coolant path 15. This operating condition occurs in the case of motor vehicle heating in the winter."

The first valve in the device disclosed in the patent to Nolting is therefore not completely closed as defined in the claims, but instead is open in direction of the bypass passage 17.

Therefore it is believed that the new features of the present invention as defined in claim 8 clearly and patentably distinguish the present invention from the patent to Nolting.

It is also respectfully submitted that claim 13, as well as claims 14-16 which depend on claim 13, should also be considered as patentably distinguishing over the patent to Nolting.

The cooling and heating circuit defined in claim 13 is not disclosed in the patent to Nolting, since a cooling medium feeding due to the thermal syphon action is not possible in the solution proposed in the patent to Nolting. The feeding of the cooling medium by the thermal syphon action presumes that the available cooling medium pumps are not active. The explanation of the thermal syphon action was presented in the previous Amendment. Claim 13 specifically defines that in a first operational phase of the internal combustion engine at low temperatures of the internal combustion engine a cooling medium supply is prevented by the thermal

syphon action, by closing of the first valve and also closing of the second valve.

If the motor in the device disclosed in the patent to Nolting is activated, then the mechanical cooling medium pump 22 is also activated. A thermal syphon action in this sense (a cooling medium pump is not active) therefore can not take place in the patent to Nolting. Moreover, it is not disclosed in the patent to Nolting that both valves must be closed. Nolting discloses a solution in which via the valves the cooling medium volume flow can be deviated in different branches of the cooling circuit. Since neither the thermal syphon action nor the closing of the both valves is not disclosed in the patent to Nolting and can not be derived from it, claims 13 should be considered as patentably distinguishing over the patent to Nolting as well.

Claim 17 as well as claims 18-20 which depend on claim 17 should also be considered as patentably distinguishing over the patent to Nolting for the same reasons. Nolting does not disclose any thermal syphon action for supplying the cooling medium flow. In particular, the patent to Nolting does not disclose to reduce a thermal syphon action, by closing the first cooling medium valve and opening the second cooling medium valve to the heating circuit. The first cooling medium valve 18 in the device disclosed in the patent to Nolting is not closed but instead is changed in its throughflow

direction. This reference does not disclose in any part of it to close
completely the valve 18.

Therefore it is believed that claim 17, as well as claims which depend on claim 17, should be considered as patentably distinguishing over the patent to Nolting.

In connection with the Examiner's rejection of the claims over the patent to Corriveau, the Examiner's attention is respectfully directed to the arguments presented in the Amendment of December 17, 2004. The patent to Corriveau does not disclose a cooling medium supply based on a thermal syphon action. Already for these reasons claims 7, 8, and 13-20 should be considered as new over the patent to Corriveau. In the anticipation rejection all features of the invention must be disclosed in the reference, which is not the case in this particular situation. The patent to Corriveau does not teach the above mentioned new features of the present invention.

Moreover, the patent to Corriveau does not disclose that the valves are completely closed to carry out the thermal syphon action as defined in claim 7. Also, it is not disclosed in this reference that the first valve with cold outside temperature is closed and the second valve is open

to the heating circuit as defined in claim 8. In the patent to Corriveau it is specifically stated in column 4, starting from line 64:

"During cold start condition, the control valve structure 26 restricts the coolant flow through the bypass circuit 24 to reduce the total flow rate through the engine below that normally obtains with the minimum rpm of the water pump 28. Under this condition, flow to the radiator 16 is prevented."

The valve 26 is therefore not closed, but instead is open in direction of the bypass passage 24. The patent to Corriveau therefore can not anticipate the claimed subject matter.

For the same reasons the patent to Corriveau also can not anticipate that both valves, which in the patent to Corriveau would be the valves 26 and 32, are closed, to suppress a supply of the cooling medium due to a thermal syphon action as defined in claim 13.

Thus, these features of the present invention are also not disclosed in the patent to Corriveau.

Also, the patent to Corriveau can not make obvious the features of claim 17. Since the patent to Corriveau does not deal with a cooling medium supply due to the thermal syphon action, nor discloses that the first valve (26) is closed while the second valve (32) is open, claim 17

should be considered as patentably distinguishing over this reference. The same is true with respect to claims 18-20 which depend on claim 17 and share its features.

As for the combination of the patents to Nolting and Banzhaf in the rejection of claims 7-8 and 13-20 as being obvious, it is believed that this rejection can not be considered as justifiable.

First of all the combination of the references can not be considered as obvious as explained in the previous Amendment. An Examiner must show what is disclosed in the reference which would justify their combination with one another. No reasons are presented in the Office Action with respect to the obviousness of the combination.

In contrast, it can not be considered as obvious to combine the patents to Nolting and Banzhaf. Nolting provides a teaching of a mechanically driven cooling medium pump for controlling of the base load and additionally connects an electrically driven cooling medium pump when it is necessary in the high load operation. Nolting with its device operates the electrical cooling medium pump, which is supplied with power from the battery of the vehicle, only for a very short time. It is completely

incomprehensible why it would be obvious to replace the mechanical cooling medium pipe by an electrical cooling medium pipe.

The patent to Nolting clearly teaches to avoid the use of an electrical cooling medium pipe as much as possible. Therefore the patent to Nolting does not teach the use of an electrical cooling medium pipe but instead it teaches away from this particular feature, since he utilizes the mechanical cooling medium pump. Therefore it can not be considered as obvious to replace the mechanical cooling medium pump with an electrical cooling medium pump. The Examiner's opinion that for a person skilled in the art it would be obvious to modify the device disclosed in the patent to Nolting can not be considered as justified. The obviousness suggested by the Examiner can not be derived from this reference. Moreover, the patent to Nolting not only does not disclose an electrically driven cooling medium for supplying the cooling medium flow, but also he does not show further important features defined in claims 7, 8 and 13-20. A combination of the patents to Nolting and Banzhaf would not lead to the applicant's invention as defined in the claims.

Claims 7, 8 and 13-20 should therefore be considered as patentably distinguishing over a combination of the patents to Nolting and Banzhaf, since a person skilled in the art who familiarized himself with these

references would not combine them. Even if for some unknown and completely probable reasons a person skilled in the art would combine the teachings of the references, he would still not arrive at the present invention.


The Examiner's statement that a thermal syphon action in the internal combustion engine can not be stopped is wrong. When the valves, as claimed are closed, a cooling medium supply, in other words a flow of the cooling medium is not possible. This is the case of the stationary cooling medium. The cooling medium with the closed valves can not discharge, since the available volume is constant. Due to the heating of the cooling medium in this case the pressure of the cooling medium is increased, but the flow of the cooling medium is not prevented. It should be again emphasized that a thermal syphon action is the feeding of the fluid, here the cooling medium, which is provided exclusively due to the force of gravity acting on the cooling medium. This however requires that the cooling medium can flow. With the closed valves, it is however not possible.

In view of the above presented remarks and amendments, it is believed that the claims which were rejected over the above discussed references should also be considered as patentably distinguishing over the art and should also be allowed.

Reconsideration and allowance of the present application is most respectfully requested.

Should the Examiner require or consider it advisable that the specification, claims and/or drawings be further amended or corrected in formal respects in order to place this case in condition for final allowance, then it is respectfully requested that such amendments or corrections be carried out by Examiner's Amendment, and the case be passed to issue. Alternatively, should the Examiner feel that a personal discussion might be helpful in advancing this case to allowance, he is invited to telephone the undersigned (at 631-549-4700).

Respectfully submitted,



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